

OPECG-2009 : Five-Day Technology Workshop
Optimizing Performance of Parallel Programs on
Emerging Multi-Core Processors & GPUs (OPECG-2009)

Jointly Organized by

Centre for Development of Advanced Computing (C-DAC), Pune &
 Indian Institute of Technology (IIT) MADRAS,

Dates : June 1-5, 2009, Venue : IIT - MADRAS

Mode 1: Day 1: June 1, 2009 (Monday)

9:00 AM ~ 9:30 AM: Reg. (Mode 1 & 2)		10:15 AM ~10:30 AM Coffee & Tea Break	
9:30 AM ~ 9:45 AM	Welcome and Inauguration An Overview of OPECG -2009 <ul style="list-style-type: none"> • Prof. M. S. Shunmugam; Head, Department of Mechanical Engineering, IIT MADRAS • Prof. S.Santha Kumar, Dean, Academic Course, IIT-MADRAS • Shri. M.Rajagopalan, Director C-DAC Chennai • Prof. R.KalyanaKrishnan, Dept. of Computer Science, IIT-MADRAS 		
9:45 AM ~ 10:15 AM	An Overview of OPECG-2009: Technical Programme (Mode 1 & Mode 2) and Hands-on Session		
10:30 AM ~ 11:30 AM	Classroom Lecture: An Overview of Multi-Core Architecture & Programming Environment for OPECG-2009 Hands-on Session		
11:30 AM ~ 1:00 PM	Classroom Lecture: Programming on Multi-Core Processors - Part-I: Pthreads & OpenMP		
Lunch: 1:00 PM ~2:00 PM		Coffee & Tea Break: 4:00 PM - 4:15 PM	
2:00 PM ~ 4:00 PM	Hands-on Session: Programming Examples using Pthreads, MPI, OpenMP - Performance Issues		
4:15 PM ~ 6:30 PM	Hands-on Session: Performance Issues: Programming Examples on Numerical & non-numerical computations using Pthreads; Multi-Threaded I/O, MPI-OpenMP, MPI-Pthreads		

Mode 1: Day 2: June 2, 2009 (Tuesday)

9:30 AM ~ 10:15 AM	Classroom Lecture: Programming on Multi-Core Processors - Part-II: An Overview of Memory Allocators & Performance Issues of I/O; Common Errors in Thread Programming		
10:15 AM ~10:30 AM Coffee & Tea Break			
10:30 AM ~ 11:30 AM	Classroom Lecture: Prog. on Multi-Core Processors - Part-III: Tuning and Compiler Optimization & Performance Issues -Mathematical libraries on Multi-Core Processors		
11:30 AM ~ 1:00 PM	Keynote Talk (INDUSTRY): Intel, Bangalore Topic: Tuning & Performance - Tools on Multi-Core Processors Speaker: Malladi, Rama Kishan V		
Lunch: 1:00 PM ~ 2:00 PM		Coffee & Tea Break: 4:00 PM - 4:15 PM	
2:00 PM ~ 4:00 PM	Hands-on Session & Demonstration: Programming Examples using Pthreads; OpenMP - Performance Issues; Example programs using Performance Visualization Tools- Intel Vtune Performance analyzer		
4:15 PM ~ 6:30 PM	Hands-on Session: Performance Issues: Open source Software tools - PAPI - on Multi-Core Processors; Compiler Optimization Techniques; Examples using Multi-threaded I/O, MPI-OpenMP, MPI-Pthreads		

Mode 1: Day 3: June 3, 2009 (Wednesday)

9:30 AM ~ 10:15 AM	Classroom Lecture: Programming on Multi-Core Processors- Part-IV: Multi-Cores - Compiler Optimization techniques; Mixed Programming Environment; Performance of Benchmarks on Multi-Cores MPI-2		
Coffee & Tea Break: 10:15 AM - 10:30 AM			
10:30 AM ~ 11:00 AM	Classroom Lecture: Programming on Multi-Core Processors- Part-V – Intel Threading Building Blocks (TBB- Performance Issues)		

Mode 1: Day 3: June 3, 2009 (Wednesday)

11:00 AM~12:00 Noon	Keynote Talk (ACADEMIC): Performance of Compression Algorithms on Multi-core Processors (Cell Processors) Speaker: Pallav Kumar Baruah ; Department of Mathematics and Computer Science Sri Sathya Sai University, Anantpur, A.P.	
12:00 Noon ~1:00 PM	Keynote Talk (ACADEMIC): Power Aware Speed up and Algorithm Based Transient Fault Tolerance in CMPs Speaker: Soumyendu Raha, SERC, IISc, Bangalore	
Lunch: 1:00 PM ~ 2:00 PM		Coffee & Tea Break: 4:00 PM - 4:15 PM
2:00 PM ~ 4:00 PM	Hands-on Session & Demonstration: Programming Examples using Pthreads; OpenMP, Example programs using Multi-Threaded I/O, MPI-OpenMP, MPI-Pthreads; Performance of Benchmarks	
4:15 PM ~ 5:15 PM	Hands-on Session: Application and System Benchmarks: Compiler Optimization Techniques - Performance of Micro & Macro Benchmarks; Thread Building Blocks- Performance issues; MPI-2 – Prog. & Examples	
5:15 PM – 6:00 PM	Invited Talk (ACADEMIC): (Will be announced)	
6:30 PM – 7:30 PM:	Cultural Programme	7:30 PM – 8:00 PM: Banquet Dinner:

Mode 2: Day 4: June 4, 2009 (Thursday)

9:00 AM ~ 9:15 AM : (Mode 2 Registration)		Coffee & Tea Break: 10:15 AM - 10:30 AM
9:15 AM ~ 9:30 AM	Classroom Lecture: An Overview of OPECG-2009 (Mode 2 Prog.)	
9:30 AM ~ 10:15 AM	Classroom Lecture: An Overview of GPU Computing - CUDA Hardware and Software - CUDA SDK, Example programs & Performance Issues	
10:30 AM ~11:30 AM	Keynote Talk (ACADEMIC): Implementing Regular and Irregular Operations on the GPU Speaker: P.J. Narayanan, IIIT, Hyderabad	
11:30 AM ~1:00 PM	Keynote Talk (Industry): High Performance Computing based on GPGPU/ GPU Computing Speakers: Mr.Sanjiv Satoor and Mr.Phani Kumar	
Lunch: 1:00 PM ~ 2:00 PM		Coffee & Tea Break: 4:00 PM - 4:15 PM
2:00 PM ~ 2:30 PM	Hands-on Session - Demonstration (NVIDIA): GPU Computing - NVIDIA - CUDA Programming; Example Programs	
2:30 PM ~ 6:00 PM	Hands-on Session: Examples using GPU Computing – NVIDIA - CUDA Prog; Programming Examples based on Mixed Programming – Hybrid Adaptive Clusters (Intel TBB, CUDA Prog. MPI-CUDA, Tbb-CUDA);	

Mode 2: Day 5: June 5, 2009 (Friday)

9:30 AM ~ 10:15 AM	Classroom Lecture: An Overview of GPGPU - Stream Computing Software Stack; Brook+ Programming	
Coffee & Tea Break: 10:15 AM - 10:30 AM		
10:30 AM ~ 11:15 AM	Classroom Lecture: GPU Stream Computing Implementation issues in Parallelisation of Applications; An Overview of OpenCL (Open Computing Language); Data Parallel Programming Issues	
11:15 AM ~ 11:30 AM	Classroom Lecture: Performance Issues CPU versus GPU – Application Perspective - Hybrid Adaptive computing (will be announced)	
11:30 AM ~ 1:00 PM	Keynote Talk (INDUSTRY): GPU Stream Computing (Will be announced)	
Lunch: 1:00 PM ~ 2:00 PM		Coffee & Tea Break: 4:00 PM - 4:15 PM
2:00 PM ~ 4:00 PM	Hands-on Session - Demonstration: Examples using GPGPU – Stream Computing; Example Programs on Hybrid Adaptive Clusters	
4:00 PM ~ 6:00 PM	Hands-on Session: Programming Examples using GPGPU Stream Software Stack – Brook+ Prog.; Programming; Examples based on Mixed Prog. – Hybrid Adaptive Clusters (Intel TBB & CUDA Prog. MPI-CUDA, TBB-CUDA); Examples using GPGPU – AMD Stream Computing	
6:00 PM ~ 6:15 PM	OPECG-2009 Project Closure	